Specifications

ATSC/8VSB characteristics (specific to EFA models 50/53 or EFA-B20 + EFA-K22)

	Standard test receiver	High-end test receiver with option EFA-B3	High-end demodulator
RF input	selective	selective [1]	non-selective
Connector	50 Ω or 75 Ω, BNC or N female, front or rear panel	50 Ω, N female, rear panel and 75 Ω, BNC female, rear panel	50 Ω, N female, rear panel
Return loss	≥14 dB in channel with 50 Ω connector and input attenuation ≥10 dB ≥12 dB in channel with 75 Ω connector and input attenuation ≥10 dB	≥17 dB (>20 dB typ.) in channel with 50 Ω connector ≥14 dB (>17 dB typ.) in channel with 75 Ω connector	≥30 dB
Frequency range [2]	48 MHz to 862 MHz	4.5 MHz [3] to 1000 MHz	45 MHz to 1000 MHz
Level range [4]	–71 dBm to +20 dBm (low distortion, preamplifier = OFF) –75 dBm to +20 dBm (low noise, preamplifier = OFF) –80 dBm to +13 dBm (low noise, preamplifier = ON)	–78 dBm to +20 dBm (normal) [5] –77 dBm to +20 dBm (low distortion) [5] –80 dBm to +16 dBm (low noise) [5]	–50 dBm to +20 dBm
Noise figure	12 dB typ. (low noise) 7 dB typ. (low noise, preamplifier = ON)	9 dB typ. (normal) [6] 7 dB typ. (low noise) [6] 11 dB typ. (low distortion) [6]	
Image frequency rejection	≥70 dB (VHF) and ≥50 dB (UHF)	100 dB	
IF rejection		100 dB	
Local oscillator			
Resolution	1 Hz	1 Hz	1 Hz
Frequency error	≤2 x 10^{-6}	≤2 x 10^{-6}	≤2 x 10^{-6}
Phase noise [7]	≥50 dB	≥58 dB	≥62 dB [8]
SSB phase noise (RF = 860 MHz)	typ. –82 dBc /Hz at 1 kHz typ. –90 dBc /Hz at 10 kHz	typ. –91 dBc /Hz at 1 kHz typ. –100 dBc /Hz at 10 kHz	typ. –93 dBc /Hz at 1 kHz typ. –106 dBc /Hz at 10 kHz
System performance			
MER	≥40 dB [9]	≥41 dB [10]	≥42 dB [11]
EVM	≤0.66% [9]	≤0.59% [10]	≤0.52% [11]
SNR	≥42dB [9]	≥43 dB [10]	≥44 dB [11]

[1] The selective RF inputs of the high-end TV test receiver (with option EFA-B3) are additional to the non-selective RF input of the high-end demodulator. For specifications involving the non-selective RF input see the high-end demodulator column.
[2] Center frequency.
[3] For frequencies < 10 MHz: group delay tilt increases up to 200 ns, amplitude tilt increases up to 0.7 dB pp typ., minimum input level: –30 dBm, SAW filter ON.
[4] For quasi error-free MPEG2 transport stream.
[5] At low input frequencies such as 4.57 MHz: additional tilt (0.7 dB pp typ.), minimum input level: –30 dBm, SAW filter ON.
[6] RF >47.15 MHz
[7] FM S/N ratio measured at IF output, referred to ±30 kHz frequency deviation and 500 Hz modulation frequency, deemphasis 50 µs, measured to DIN45405, weighted to CCIR468-3.
[8] In frequency range 45 MHz to 900 MHz.
[9] Signal power >–40 dBm, equalizer on.
[10] Signal power >–43 dBm, equalizer on.
[11] Signal power >–30 dBm, equalizer on.

ATSC/8VSB common characteristics

IF input	50 Ω, BNC female, rear panel	
Return loss	≥20 dB in channel	
Center frequency	36 MHz	
Level range	–30 dBm to –5 dBm	
IF output	50 Ω, BNC female, rear panel	
Return loss	≥20 dB	
Center frequency	36 MHz	
Level, regulated	–17 dBm	
MPEG2 TS parallel output	LVDS (188 bytes)	
MPEG2 TS ASI output	serial MPEG2 transport stream (ASI); 75 Ω	
SMPTE 310M output	800 mV pp, 75 Ω (only with nominal symbol rate of 10.762238 Msymbols/s)	
Symbol rate	2 Msymbols/s to 11 Msymbols/s (default 10.762238 Msymbols/s)	
Bandwidth (SAW filter)	2 MHz, 6 MHz, 8 MHz or SAW filter OFF	
Channel correction	self-adapting equalizer, equalizer freeze, equalizer off	
Measurements	signal power pilot carrier frequency offset pilot value pilot amplitude error data signal power to pilot carrier power ratio symbol rate offset MPEG2 TS bit rate BER (bit error ratio) before and after Reed-Solomon decoder	SER (segment error ratio) [1] segment errors per second [1] EVM (error vector magnitude) MER (modulation error ratio) SNR (signal/noise ratio) phase jitter crest factor shoulder attenuation (referred to FCC recommendation)
Graphic displays	constellation diagram histogram I/Q frequency spectrum amplitude frequency response phase frequency response group delay frequency response	polar plot amplitude distribution (RF) CCDF (RF) eye monitoring history
Alarm messages	signal power, synchronization, EVM, MER, BER before Reed-Solomon decoder, MPEG2 data error	
Storage	alarm message with date and time, up to 1000 messages	
Memory for instrument setup storage	0 to 4	

[1] Available from April 2002.

Test parameters	Range	Resolution	Error
Signal power	depending on model, see above	0.1 dB	<3 dB, typ. <1 dB
MER (modulation error ratio)	18 dB to 30 dB 30 dB to 35 dB	0.1 dB 0.1 dB	≤0.8 dB ≤1.0 dB
MER (modulation error ratio)	1.9% to 3.2% 3.2% to 12.5%	0.01% 0.01%	≤12% of actual value ≤10% of actual value
EVM (error vector magnitude)	1.17% to 2.07% 2.07% to 8.3%	0.01% 0.01%	≤12% of actual value ≤10% of actual value
SNR (signal/noise ratio)	18 dB to 30 dB 30 dB to 35 dB	0.1 dB 0.1 dB	≤0.5 dB ≤0.8 dB
Data signal/pilot power ratio	7 dB to 19 dB	0.1 dB	≤0.2 dB (SAW filter OFF)
Pilot amplitude error	–8 dB to +4 dB	0.1 dB	≤0.2 dB (SAW filter OFF)
Pilot value	0.5 to 2	0.01	≤0.03 (SAW filter OFF)
Pilot carrier frequency offset	±100 kHz	1 Hz	≤280 Hz + 2 ppm x RF
Symbol rate offset	±150 ppm	0.1 ppm	<10 ppm, typ. <3 ppm
BER before Reed-Solomon	1.0×10^{-3} to 0.1×10^{-15}	$0.1 \times 10^{-\text{exponent}}$	–
BER after Reed-Solomon	1.0×10^{-5} to 0.1×10^{-14}	$0.1 \times 10^{-\text{exponent}}$	–
SER (segment error ratio) [1]	1.3×10^{-3} to 0.1×10^{-12}	$0.1 \times 10^{-\text{exponent}}$	–
Segment errors/s [1]	1.0×10^{-12} to 10×10^{-3}	$0.1 \times 10^{-\text{exponent}}$	–

[1] Available from April 2002.

Specifications

ITU-T J.83/B characteristics (specific to EFA models 70/73 or options EFA-B20 + EFA-K23)

	Standard test receiver	High-end test receiver with option EFA-B3	High-end demodulator
RF input	selective	selective [1]	non-selective
Connector	50 Ω or 75 Ω, BNC or N female, front or rear panel	50 Ω, N female, rear panel and 75 Ω, BNC female, rear panel	50 Ω, N female, rear panel
Return loss	≥14 dB in channel with 50 Ω connector and input attenuation ≥10 dB ≥12 dB in channel with 75 Ω connector and input attenuation ≥10 dB	≥17 dB (>20 dB typ.) in channel with 50 Ω connector ≥14 dB (>17 dB typ.) in channel with 75 Ω connector	≥30 dB
Frequency range [2]	48 MHz to 862 MHz	4.5 MHz [3] to 1000 MHz	45 MHz to 1000 MHz
Level range [4]	–58 dBm to +20 dBm (low distortion, preamplifier = OFF) –62 dBm to +20 dBm (low noise, preamplifier = OFF) –67 dBm to +13 dBm (low noise, preamplifier = ON)	–66 dBm to +20 dBm (normal) [5] –65 dBm to +20 dBm (low distortion) [5] –68 dBm to +16 dBm (low noise) [5]	–50 dBm to +20 dBm
Noise figure	12 dB typ. (low noise) 7 dB typ. (low noise, preamplifier = ON)	9 dB typ. (normal) [6] 7 dB typ. (low noise) [6] 11 dB typ. (low distortion) [6]	
Image frequency rejection	≥70 dB (VHF) and ≥50 dB (UHF)	100 dB	
IF rejection		100 dB	
Local oscillator			
Resolution	1 Hz	1 Hz	1 Hz
Frequency error	≤2 x 10^{-6}	≤2 x 10^{-6}	≤2 x 10^{-6}
Phase noise [7]	≥50 dB	≥58 dB	≥62 dB [8]
SSB phase noise (RF = 860 MHz)	typ. –82 dBc /Hz at 1 kHz typ. –90 dBc /Hz at 10 kHz	typ. –91 dBc /Hz at 1 kHz typ. –100 dBc /Hz at 10 kHz	typ. –93 dBc /Hz at 1 kHz typ. –106 dBc /Hz at 10 kHz
System performance			
MER	≥40 dB [9]	≥41 dB [10]	≥42 dB [11]
EVM	≤0.66% [9]	≤0.59% [10]	≤0.52% [11]
SNR	≥42dB [9]	≥43 dB [10]	≥44 dB [11]

[1] The selective RF inputs of the high-end TV test receiver (with option EFA-B3) are additional to the non-selective RF input of the high-end demodulator. For specifications involving the non-selective RF input see the high-end demodulator column.
[2] Center frequency.
[3] For frequencies < 10 MHz: group delay tilt increases up to 200 ns, amplitude tilt increases up to 0.7 dB pp typ., minimum input level: –30 dBm, SAW filter ON.
[4] For quasi error-free MPEG2 transport stream, 256QAM.
[5] At low input frequencies such as 4.57 MHz: additional tilt (0.7 dB pp typ.), minimum input level: –30 dBm, SAW filter ON.
[6] RF >47.15 MHz
[7] FM S/N ratio measured at IF output, referred to ±30 kHz frequency deviation and 500 Hz modulation frequency, deemphasis 50 µs, measured to DIN45405, weighted to CCIR468-3.
[8] In frequency range 45 MHz to 900 MHz.
[9] Signal power >–40 dBm, equalizer on.
[10] Signal power >–43 dBm, equalizer on.
[11] Signal power >–30 dBm, equalizer on.

Certified Environmental System ISO 14001 REG. NO 1954

Certified Quality System ISO 9001 DQS REG. NO 1954

ITU-T J.83/B common characteristics

IF input	50 Ω, BNC female, rear panel
Return loss	≥20 dB in channel
Center frequency	36 MHz
Level range	–30 dBm to –5 dBm
IF output	50 Ω, BNC female, rear panel
Return loss	≥20 dB
Center frequency	36 MHz
Level, regulated	–17 dBm
MPEG2 TS parallel output	LVDS (188 bytes)
MPEG2 TS ASI output	serial MPEG2 transport stream (ASI); 75 Ω
Symbol rate	1 Msymbols/s to 6.999 Msymbols/s
Bandwidth (SAW filter)	2 MHz, 6 MHz, 8 MHz or SAW filter OFF
Channel correction	self-adapting equalizer, equalizer freeze, equalizer off
Measurements	signal power carrier frequency offset symbol rate offset MPEG2 TS bit rate BER (bit error ratio) before and after Reed-Solomon decoder EVM (error vector magnitude) MER (modulation error ratio) SNR (signal/noise ratio) phase jitter I/Q amplitude imbalance I/Q quadrature error carrier suppression crest factor shoulder attenuation
Graphic displays	constellation diagram histogram I/Q frequency spectrum amplitude frequency response phase frequency response group delay frequency response polar plot amplitude distribution (RF) CCDF (RF) eye monitoring history
Alarm messages	signal power, synchronization, EVM, MER, BER before Reed-Solomon decoder, MPEG2 data error
Storage	alarm message with date and time, up to 1000 messages
Memory for instrument setup storage	0 to 4

Test parameters	**Range**	**Resolution**	**Error**
Signal power	corresponding to level range	0.1 dB	<3 dB, typ. <1 dB
MER dB (modulation error ratio in dB)	18 dB to 30 dB 30 dB to 35 dB	0.1 dB 0.1 dB	≤0.8 dB ≤1.0 dB
MER % (modulation error ratio in %)	1.9% to 3.2% 3.2% to 12.5%	0.01% 0.01%	≤12% of actual value ≤10% of actual value
EVM (error vector magnitude)	1.17% to 2.07% 2.07% to 8.3%	0.01% 0.01%	≤12% of actual value ≤10% of actual value
SNR (signal/noise ratio)	18 dB to 30 dB 30 dB to 35 dB	0.1 dB 0.1 dB	≤0.5 dB ≤0.8 dB
I/Q amplitude imbalance	0.00% to 5.00%	0.01%	≤0.03%
I/Q quadrature error	0.00° to 5.00°	0.01°	≤0.03°
Carrier suppression	25 dB to 45 dB 45 dB to 60 dB	0.1 dB 0.1 dB	≤1.0 dB ≤3.0 dB
Carrier frequency offset	±100 kHz	1 Hz	≤280 Hz + 2 ppm x RF
Symbol rate offset	±150 ppm	0.1 ppm	<10 ppm, typ. <3 ppm
MPEG TS bit rate	5.333 Mbit/s to 43.433 Mbit/s	1 kbit/s	<1 kbit/s
BER before Reed-Solomon	1.0×10^{-3} to 0.1×10^{-15}	$0.1 \times 10^{-\text{exponent}}$	–
BER after Reed-Solomon	1.0×10^{-5} to 0.1×10^{-14}	$0.1 \times 10^{-\text{exponent}}$	–

Specifications

NTSC/BTSC characteristics (specific to EFA models 90/93 or option EFA-B30)

	Standard test receiver	High-end test receiver with option EFA-B3	High-end demodulator
RF input	selective	selective [1]	non-selective
Connector	50 Ω or 75 Ω, BNC or N female, front or rear panel	50 Ω, N female, rear panel and 75 Ω BNC female, rear panel	50 Ω, N female, rear panel
Return loss	≥14 dB in channel with 50 Ω connector and input attenuation ≥10 dB ≥12 dB in channel with 75 Ω connector and input attenuation ≥10 dB	≥17 dB (>20 dB typ.) in channel with 50 Ω connector ≥14 dB (>17 dB typ.) in channel with 75 Ω connector	≥30 dB
Frequency range [2]	45 MHz to 860 MHz	5 MHz [3] to 1000 MHz	45 MHz to 1000 MHz
Level range [4]	–67 dBm to +13 dBm (preamplifier = OFF) –77 dBm to +3 dBm (preamplifier = ON)	–67 dBm to +21 dBm (normal) [5] –67 dBm to +21 dBm (low distortion) [5] –77 dBm to +21 dBm (low noise) [5]	–41 dBm to +21 dBm
Noise figure	12 dB typ. (low noise) 7 dB typ. (low noise, preamplifier = ON)	9 dB typ. (normal) 7 dB typ. (low noise) 11 dB typ. (low distortion)	
Image frequency rejection	≥70 dB (VHF) [6] and ≥50 dB (UHF) [6]	100 dB	
IF rejection		100 dB	
Local oscillator			
Resolution	1 Hz	1 Hz	1 Hz
Frequency error	≤2 x 10^{-6}	≤2 x 10^{-6}	≤2 x 10^{-6}
Phase noise [7]	≥50 dB	≥58 dB	≥62 dB [8]
SSB phase noise (RF = 860 MHz)	typ. –82 dBc /Hz at 1 kHz typ. –90 dBc /Hz at 10 kHz	typ. –91 dBc /Hz at 1 kHz typ. –100 dBc /Hz at 10 kHz	typ. –93 dBc /Hz at 1 kHz typ. –106 dBc /Hz at 10 kHz
Video demodulation			
Signal/noise ratio (referred to b/w transition)	P_{RF} ≥–30 dBm	P_{RF} = –33 dBm	P_{RF} ≥–1 dBm
S/N_{rms} weighted to CCIR Rec. 567	low noise: ≥60 dB typ. 64 dB low distortion: ≥57 dB typ. 59 dB	low noise: ≥64 dB typ. 66 dB low distortion: ≥62 dB typ. 64 dB	≥67 dB typ. 70 dB
Nonlinear distortion (with synchronous detector)			
Luminance nonlinearity	≤2%	≤2%	≤2%
Differential gain	≤2%	≤2%	≤2%
Differential phase	≤1°	≤1°	≤1°
Intermodulation in channel, referred to b/w transition	low noise: ≥52 dB low distortion: ≥62 dB	low noise: ≥52 dB low distortion: ≥62 dB	≥55 dB
3rd-order intercept point (0 dB attenuation)	low noise: ≥0 dB low distortion: ≥+5 dB	normal: ≥+10 dBm low distortion: ≥+14 dBm	
Linear distortion [9]			
12.5T pulse amplitude error Sound trap OFF (BW=5 MHz) Sound trap ON (BW=4 MHz)			≤5% typ. <2% ≤10% typ. <5%
Amplitude frequency response Sound trap OFF Sound trap ON	reference: 0.5 MHz ≤0.5 dB (DC to 4.2 MHz) ≤0.5 dB (DC to 3.6 MHz)	reference: 0.5 MHz ≤0.35 dB (DC to 4.2 MHz) ≤0.35 dB (DC to 3.6 MHz)	reference: 0.5 MHz ≤0.25 dB (DC to 4.2 MHz) ≤0.25 dB (DC to 3.6 MHz)
Group delay frequency response	reference 0.1 MHz	reference 0.1 MHz	reference 0.1 MHz
Flat group delay (≤4.2 MHz)	≤25 ns	≤20 ns	≤20 ns
FCC group delay (≤3.6 MHz)	≤25 ns	≤20 ns	≤20 ns
Transient response (with synchronous detection)	12.5/75% modulation	12.5/75% modulation	12.5/75% modulation
2T pulse k factor	≤1%	≤1% typ. 0.6%	≤1% typ. 0.5%
2T pulse amplitude error			≤2% typ. 1%
12.5T pulse amplitude error			≤5%
Chrominance/luminance gain			≤3%
Chrominance/luminance delay Flat group delay FCC group delay	≤20 ns ≤20 ns	≤15 ns ≤20 ns	≤12 ns ≤20 ns
Tilt, 15 kHz, T_{rise} 200 ns	≤1%	≤1%	≤1%

[1] The selective RF inputs of the high-end TV test receiver (with option EFA-B3) are additional to the non-selective RF input of the high-end demodulator. For specifications involving the non-selective RF input see the high-end demodulator column.

[2] Vision carrier frequency.

[3] For frequencies < 10 MHz: group delay tilt increases up to 200 ns, amplitude tilt increases up to 0.7 dB pp typ., minimum input level: –30 dBm, SAW filter ON.

[4] Levels are rms values referred to sync. pulse.

[5] In receive range 5 MHz to 20 MHz: .–41 dBm to +20 dBm.

[6] Image frequency of vision carrier.

[7] FM S/N ratio measured at IF output, referred to ±30 kHz frequency deviation and 500 Hz modulation frequency, deemphasis 50 µs, measured to DIN45405, weighted to CCIR468-3.

[8] In frequency range 45 MHz to 900 MHz.

[9] Additional ripple caused by SAW filter.

Common NTSC/BTSC demodulator characteristics (EFA models 90/93 or option EFA-B30)

IF input	50 Ω, BNC female, rear panel
Vision carrier frequency	38.9 MHz
Return loss (34 MHz to 40 MHz)	≥20 dB
Input level	–21 dBm to –1 dBm (rms value referred to sync pulse)
IF output	50 Ω, BNC female, rear panel
IF vision carrier frequency	38.9 MHz
Return loss (34 MHz to 40 MHz)	≥20 dB
Input level, regulated	–7 dBm (rms value referred to sync pulse)
Amplitude frequency response (34 MHz to 40 MHz)	≤0.25 dB
Intercarrier input	50 Ω, BNC female, rear panel
Intercarrier frequency	4.5 MHz
Return loss (4.4 MHz to 4.6 MHz)	≥20 dB
Input level	–35 dBm to –15 dBm
Zero reference	selectable: internal/external/off
Position of internal zero reference pulse	8 µs to 55 µs in line, line 10 to 22 selectable, field 1/2 selectable
External zero reference input	75 Ω, BNC female, rear panel
Control voltage	>1 V
Delay of carrier blanking relative to control pulse	<3 µs
Video demodulation	synchronous and envelope detector (switchable)
Synchronous detector PLL mode: PLL bandwidth	sampled: medium, slow continous: fast, medium, slow
Video bandwidth/group delay (sound trap)	4 MHz (FCC), 5 MHz (FCC), 5 MHz (FLAT)
Video outputs	75 Ω, BNC female, front panel ;75 Ω, BNC female, rear panel
Return loss (0 to 5 MHz)	≥26 dB
Output level (CCVS, modulation depth 87.5%)	1.0 V_{PP} ±2% into 75 Ω
DC offset of video signal, zero vision carrier	0 V ±20 mV
Decoupling of outputs (level variation at terminated output when switching the other outpus between short circuit and open circuit)	≤1%
Quadrature output of synchronous detector	75 Ω, BNC female, rear panel
Return loss (0 to 5 MHz)	≥20 dB
Gain error referred to inphase signal	≤1 dB
Audio demodulation modes	split carrier, quasi split carrier, intercarrier
Audio composite output	75 Ω, BNC female, rear panel
Output level into 75 Ω	10 mV/kHz FM deviation
Amplitude frequency response	
30 Hz to 47 kHz	≤±0.05 dB
47 kHz to 120 kHz	≤±0.5 dB
Phase frequency response	
30 Hz to 47 kHz	≤±0.5°
THD (±25 kHz FM deviation)	
f_{mod} 30 Hz to 15 kHz	≤0.1%
$±f_{mod}$ 15 kHz to 50 kHz	≤0.5%
Audio stereo outputs (BTSC/MTS)	Lemo Triax connectors, in pairs, front panel, unbalanced, Z<10 Ω
Signals	left/right, SAP, mono, L + R/L - R
Audio mono output (main channel)	Lemo Triax connector rear panel, balanced, non-floating, Z<10 Ω
Output level into 600 Ω at ±25 kHz FM deviation and 500 Hz f_{mod}	0 dBm to 10 dBm, adjustable in 0.1 dB steps
Deemphasis	75 µs/OFF
Amplitude frequency response, 30 Hz to 15 kHz	≤±0.3 dB
THD, ±25 kHz FM deviation, f_{mod} 30 Hz to 15 kHz	≤0.1%
Signal/noise ratio	
Deemphasis 75 µs, referred to ±25 kHz FM deviation)	measured to DIN 45405, weighted to CCIR 468-3
Split-carrier mode	≥60 dB
Quasi-split carrier mode/intercarrier mode	
With all-black picture modulation	≥60 dB
With sinewave modulation (0 to 4 MHz)	≥50 dB
Alarm messages	
Vision carrier level, TV synchronization, vision/sound carrier ratio, FM deviation MTS pilot, FM deviation main channel, FM deviation BTSC channel	

Specifications (options)

Common NTSC/BTSC demodulator characteristics cont. (EFA models 90/93 or option EFA-B30)

Test parameters	Resolution	Error
Vision carrier level (rms value referred to sync. pulse)	0.1 dB	≤3 dB
Residual picture carrier	0.1%	≤0.5%
Modulation depth of vision carrier	0.1%	≤0.5%
BAR Amplitude	0.1 IRE	≤1 IRE
Sync Amplitude	0.1 IRE	≤1 IRE
Video Amplitude	0.1 IRE	≤1 IRE
Vision/sound carrier ratio	0.1 dB	≤2 dB
FM deviation (main channel)	100 Hz	≤3% +200 Hz
FM deviation (BTSC channel)	100 Hz	≤3% +200 Hz
FM pilot deviation (MTS pilot)	10 Hz	≤5%

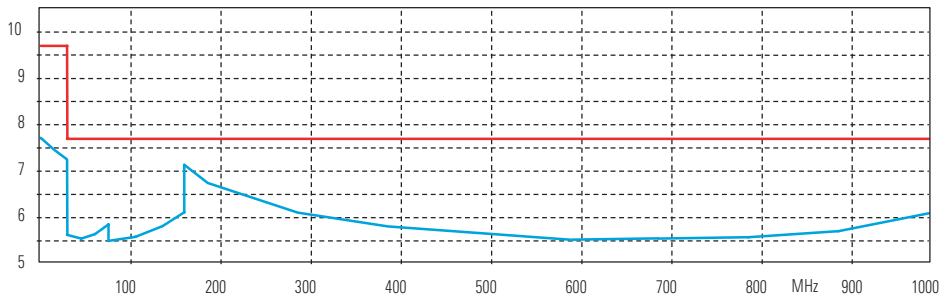
Options

RF Preselection EFA-B3

RF preselection for High-End Demodulator Models EFA 53/73/93. Two selective RF inputs with 50 Ω and 75 Ω impedance in addition to the non-selective RF input of the high-end demodulator. Demodulation of variable IFs (analog TV) up to 50 MHz via the selective RF inputs.

IF inputs	selective
Connectors	50 Ω, N female, rear panel and 75 Ω, BNC female, rear panel
Return loss	17 dB (>20 dB typ.) in channel with 50 Ω connector 14 dB (>17 dB typ.) in channel with 75 Ω connector
Frequency range	4.5 MHz [1] to 1000 MHz
Level range	see high-end test receiver column of relevant demodulator mode
System performance	
Noise figure	7 dB typ. (low noise) 9 dB typ. (normal) 11 dB typ. (low distortion)
Image frequency rejection	100 dB
IF rejection	100 dB

[1] For frequencies < 10 MHz: group delay tilt increases up to 200 ns, amplitude tilt increases up to 0.7 dB pp typ., minimum input level: –30 dBm, SAW filter ON.



Noise figure (low noise mode)

Options (continued)

MPEG2 Decoder EFA-B4

Realtime measurement functions: simultaneous monitoring of all signals in transport stream.
Realtime measurement functions according to test specifications for DVB systems (ETR290): priorities 1, 2 and 3.

Signal format	
Transport stream	to ISO/IEC 1-13818
Data rate of transport stream	up to 54 Mbit/s
Length of data packets	188/204 bytes, automatic switchover
Signal input	
Internal: from DVB demodulator	
External: asynchronous serial MPEG2 transport stream, 270 Mbit/s (TS ASI)	BNC connector on rear panel, 200 mV pp to 1 V pp, 75 Ω
Video signal output	
CCVS (PAL, SECAM, NTSC)	BNC connector on rear panel, 1 V pp ±1%, 75 Ω
Video serial digital (ITU-R 601), 270 Mbit/s	BNC connector on rear panel, 800 mV pp, 75 Ω
Audio signal outputs	
Connectors front panel	Lemo Triax female, in pairs, unbalanced, <25 Ω
Connectors rear panel	Lemo Triax female, in pairs, balanced, floating, <25 Ω
Signals	mono, left/right, sound 1/ sound 2
Level of balanced output at rear panel (full scale)	+6 dBm ±0.2 dB into 600 Ω
Frequency response (40 Hz to 15 kHz)	±0.5 dB relative to 1 kHz
S/N ratio	>70 dB, unweighted
THD	>70 dB

Video Distributor EFA-B6

Video output	2 x BNC female on front panel; 2 x BNC female on rear panel; 75 Ω
Return loss (0 to 6 MHz)	≥26 dB
Level accuracy	≤2%
DC offset of video signal (MPEG2 decoder mode, black level	0 V
DC offset of video signal (analog TV mode, zero vision carrier)	0 V ±20 mV
Decoupling of outputs (level variation at terminated output when switching the other outputs between short circuit and open circuit)	≤1%
Quadrature signal output	1 x BNC female on front panel; 1 x BNC female on rear panel; 75 Ω
Return loss (0 to 6 MHz)	≥20 dB
Decoupling of outputs (level variation at terminated output when switching the other outputs between short circuit and open circuit)	≤1%

6 MHz SAW Filter EFA-B11

Ripple in band	0.4 dB pp
Rejection of adjacent channels	>50 dB (>±3.8 MHz); >85 dB (>±5.3 MHz) with High Adj. Chan Power ON

8 MHz SAW Filter EFA-B13

Ripple in band	0.8 dB pp
Rejection of adjacent channels	>55 dB (>±4.4 MHz); >90 dB (>± 5.3 MHz) with High Adj. Chan Power ON

2 MHz SAW Filter EFA-B14

Ripple in band	0.7 dB pp
Rejection of adjacent channels	>45 dB (>±1.3 MHz)

General data

Display	monochrome LCD (320 x 240), backlit
Interfaces	IEC625-2/IEEE488 bus, RS-232-C, printer (Centronics)
Temperature range	to IEC68-2-1/-2
Rated temperature range/Operating temperature range	+5 °C to +45 °C/0 °C to +50 °C
Power supply	100 V to 120 V/220 V to 240 V, +10%/–15% (autoranging), 50 Hz to 60 Hz
Power consumption	EFA 12/60/78: 70 VA, EFA 33/63/89: 75 VA, EFA 33/63/89 + EFA-B3: 90 VA
Dimensions (W x H x D)	435 mm x 147 mm x 460 mm
Weight	approx. 12 kg, depending on options

Ordering information

ATSC/8VSB Test Receiver [1] Selective, constellation diagram, MPEG2 data stream output	EFA 50	2067.3004.50
ATSC/8VSB Test Demodulator [1] Broadband, constellation diagram, MPEG2 data stream output	EFA 53	2067.3004.53
ITU-T J.83/B Test Receiver [1] Selective, constellation diagram, MPEG2 data stream output	EFA 70	2067.3004.70
ITU-T J.83/B Test Demodulator [1] Broadband, constellation diagram, MPEG2 data stream output	EFA 73	2067.3004.73
TV Test Receiver, Std. M/N/NTSC/BTSC RF 45 MHz to 860 MHz	EFA 90	2067.3004.90
TV Demodulator, Std. M/N/NTSC/BTSC RF 45 MHz to 1000 MHz	EFA 93	2067.3004.93

[1] Note: please fill in configuration sheet (available from your local representative or from Rohde & Schwarz website, EFA section) so that your test receiver / demodulator can be tailored to your requirements.

Options

RF Preselection for demodulators (models 53, 73, 93)	EFA-B3	2067.3627.02
MPEG2 Decoder	EFA-B4	2067.3633.02
Video Distributor (4 video outputs, only models 53, 73, 93)	EFA-B6	2067.3656.02
Residual Picture Carrier Measurement	EFA-B8	2067.3727.02
6 MHz SAW Filter	EFA-B11	2067.3691.00
8 MHz SAW Filter	EFA-B13	2067.3579.03
2 MHz SAW Filter	EFA-B14	2067.3562.00
Digital Demodulator Platform	EFA-B20	2067.3585.02
M/N NTSC/BTSC Demodulator	EFA-B30	2067.4046.02

Firmware options

DVB-C / J83/A/C (QAM) Firmware (for models 50, 53, 70, 73 or option EFA-B20)	EFA-K21	2067.4000.02
ATSC/8VSB Firmware (for models 60, 63, 70, 73 or option EFA-B20)	EFA-K22	2067.4017.02
J.83/B Firmware (for models 50, 53, 70, 73 or option EFA-B20)	EFA-K23	2067.4023.02
FIR Coefficient Readout Firmware (only for EFA5x or EFA-B20 + EFA-K22)	EFA-K25	2067.4046.02

Recommended extras

EFA Calibration Values	EFA-DCV	2082.0490.09
EFA-B4 Calibration Values	EFA-DCV	2082.0490.15
19" Adapter	ZZA-93	0396.4892.00
Lemo Triax connector (mono) with connecting cable (open)		2067.7451.00
Service manual		2068.0950.24
Carrying Bag for 19" units, 3 HU, depth 460 mm	ZZT-314	1001.0523.00

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Printed in Germany 0102 (U bb, kr)